

MAY 2008

# UTILITY ENGINEERING



## BITING THE BULLET

Northern Gas Networks  
harnesses water power to  
dismantle Wakefield  
gas tanks



**WATER**

**Measuring turbidity**

**ELECTRICITY**

**On the right track**

**AUTOMATION**

**New data standards**

A **UTILITYWEEK** supplement





General enquiries: 020 8652 8678

**Editor:**  
Steve Hobson 020 8652 3806  
steve.hobson@rbi.co.uk

**Advertising sales:**  
Fay Newman 020 8652 8690  
fay.newman@rbi.co.uk

**Sales coordinator:**  
Alex Carden 020 8652 8678  
alex.carden@rbi.co.uk

**Publisher:**  
Roger Williams 020 8652 4880  
roger.williams@rbi.co.uk

**Design and layout:**  
Vivid Associates  
bobbie@vividassociates.com

**Printed by:**  
Williams Press Ltd, Cordwallis  
Works, Maidenhead,  
Berks SL6 7DX

**Published by:**  
Reed Business Information,  
Quadrant House, The Quadrant,  
Sutton, Surrey SM2 5AS.

 Reed Business Information

 **recycle**  
When you have finished with  
this magazine please recycle it.

# Anyone there?

Once upon a time, a visitor to a water or sewage treatment works would have seen lots of men (very few women, let's face it) in boots and hard hats walking around with spanners fixing things, swinging valves and generally keeping the show on the road.

Now you're lucky if there's a security guard on duty at the gate, such is the degree of automation and unmanning we have seen in the last few years.



This has been for two reasons – first, automation is cheaper than employing lots of people and, second, fewer people want to work for utilities.

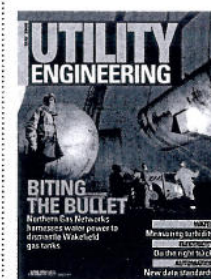
So it's a win-win for utilities, right?

Well, up to a point. Automated systems and remote monitoring has come down in price and up in reliability over the years, but what happens when things go wrong?

If utilities lose traditional engineering skills and come to rely more on IT and process control people there is a danger that there will be no-one left to run the plant if all the SCADA systems fall over.

Steve Hobson  
Editor

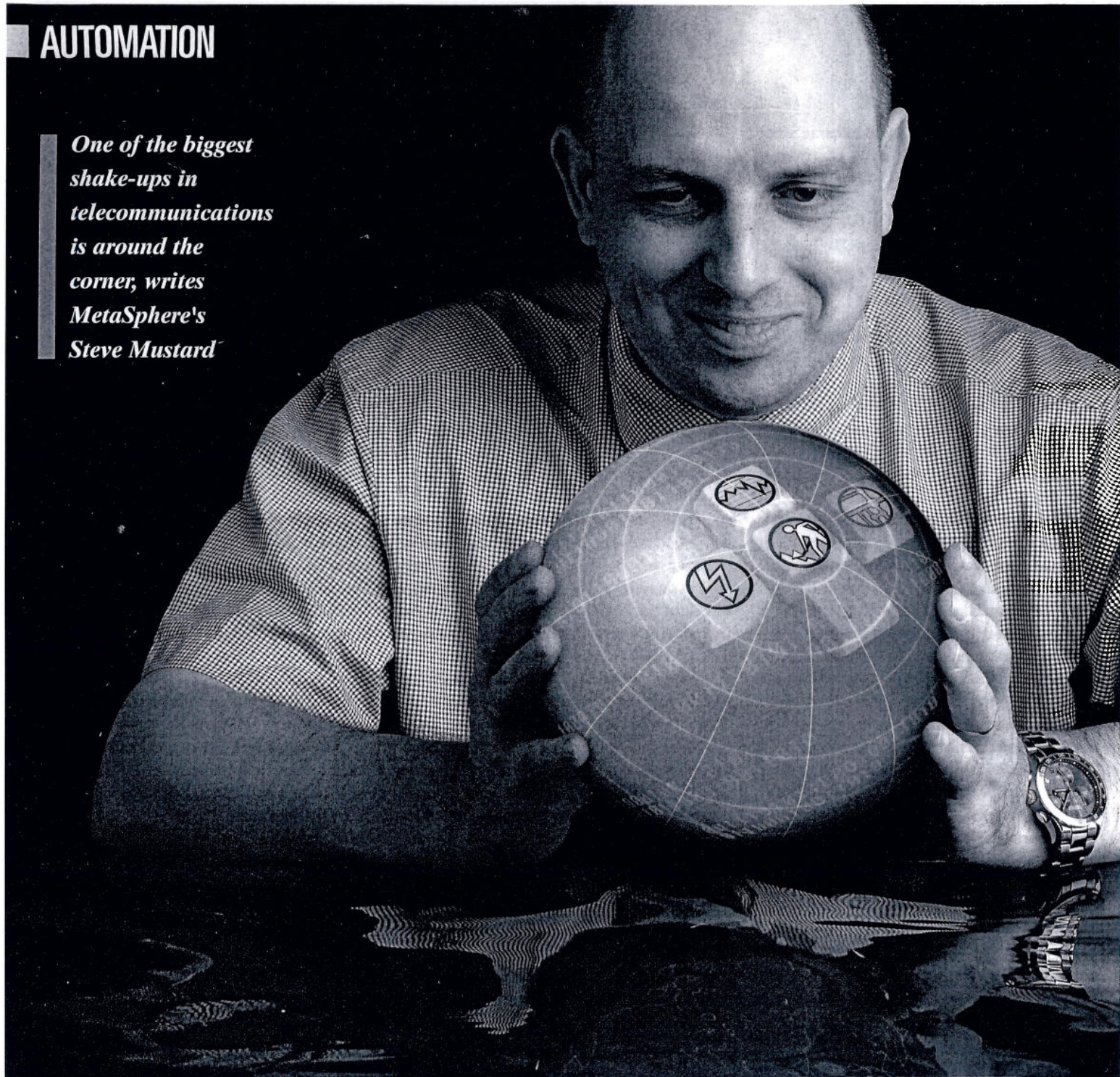
<b>News</b>	4
<b>Maintenance matters</b>	8
<b>Electricity</b> <i>Powering Eurostar</i>	10
<b>Water</b> <i>Getting on top of leaks</i>	12
<b>Gas</b> <i>Feel the quality</i>	15
<b>Automation</b> <i>Future standards</i>	16
<b>Streetworks</b> <i>Micro-surgery for roads</i>	18
<b>Technology</b> <i>Measuring water turbidity</i>	19
<b>Product news</b>	21



Cover:  
United Utilities dismantles high pressure gas storage "bullets" in Wakefield after almost 40 years of continuous service



*One of the biggest shake-ups in telecommunications is around the corner, writes MetaSphere's Steve Mustard*



# Future proof?

For many years control and automation systems have relied upon widely available communications options such as UHF radio, PSTN, private wire and, more recently, GSM and GPRS to get data to and from remote sites. Field devices at these remote sites (remote telemetry units and data loggers), on the other hand, have communicated with central supervisory systems using a range of proprietary protocols that automatically inhibits vendor interoperability.

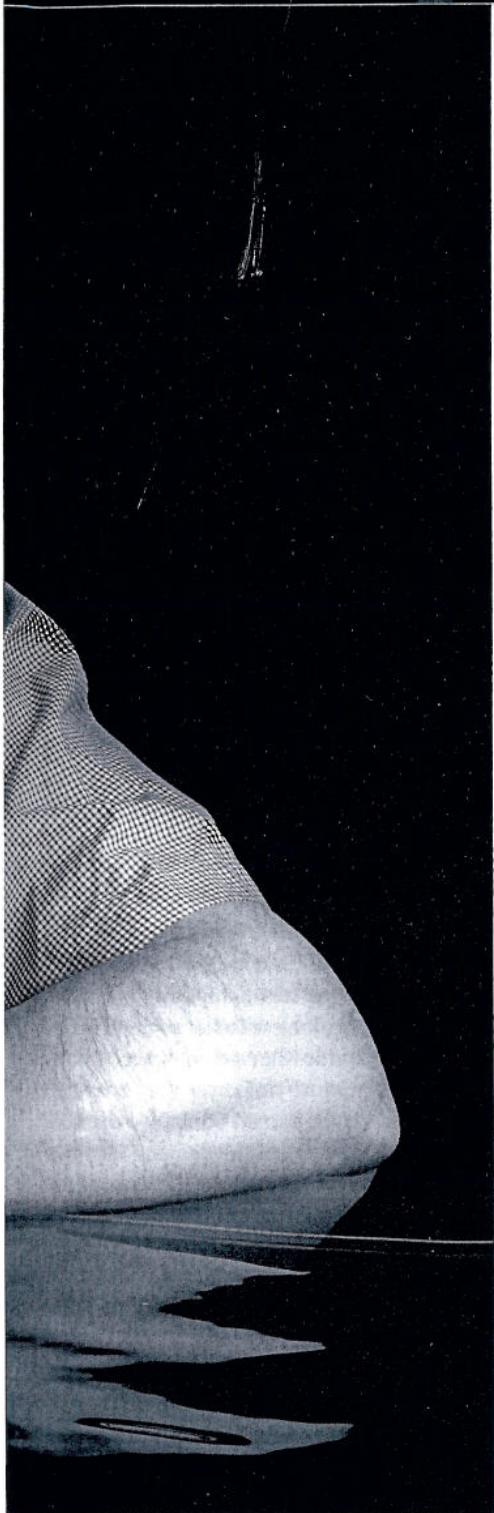
This "closed" approach has meant that the interchange of data between the central supervisory system and other business systems has been limited to specific tactical solutions to meet critical business needs. Unfortunately, as these business needs have evolved, the systems have generally failed to keep up in a cost effective manner – the result being a stifling of innovation.

The availability of traditional communications methods has meant that users have no need to

seek out alternatives and even if they did, proprietary communications and highly specialised equipment would not necessarily yield any significant benefit. The difficulty in cost-effectively integrating some specialised systems means that highly manual and error prone business processes remain in use.

An unprecedented wave of change is about to sweep over control and automation systems in the UK. BT has begun the final stages of rollout of the 21st Century Network (21CN), the most significant change to the telephone network since its inception. While enabling a huge range of new services for domestic users and reducing BT's maintenance costs, the impact to utilities will be significant. There are





converter approach sums up the typical stifled innovation approach. Instead, the adoption of a new communications option should be seen as a foundation to build a new and future-proof solution.

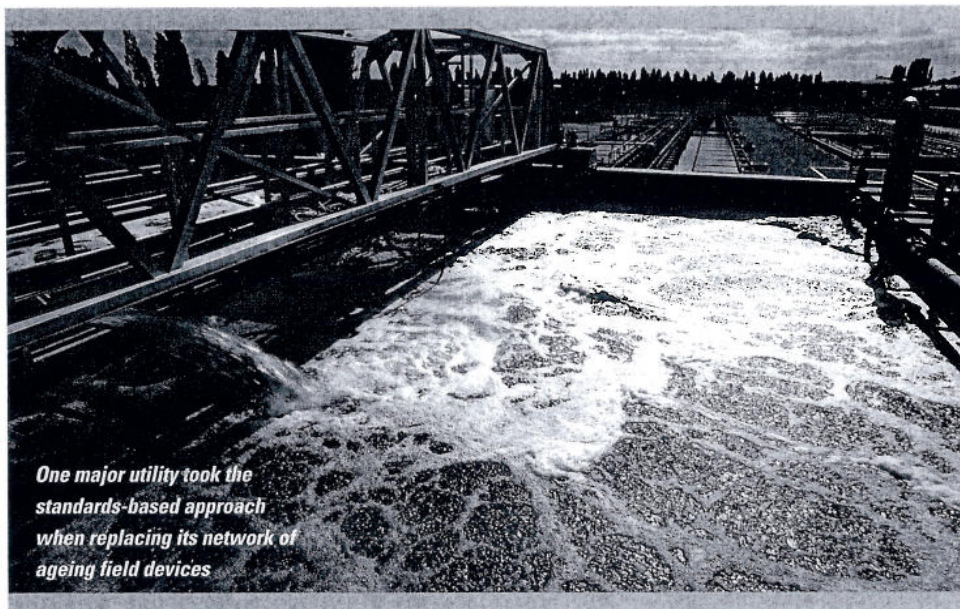
A major utility in the UK took the standards-based approach when it chose to replace its network of ageing field devices and communications lines based on private wire. Rather than upgrade to a newer private wire, or adopt a another like-for-like replacement, the utility chose to build a new foundation starting with a TCP/IP enabled network running over a diverse set of communications media including satellite and UHF radio. Once deployed the network was capable of supporting any current or future communications requirement (such as a new telemetry protocol, deployment of other services such as voice over IP or multi-media) without any material change.

Like any foundation, this takes time to

*Defining the objects that the systems maintain data about, helps to ensure that any new requirement can be met by the existing interfaces*

foundation required for a truly standardised, future-proof solution. When choosing a replacement for PSTN and GSM/GPRS, don't choose a like-for-like replacement without considering the potential benefits of implementing a network that can provide existing functionality but also cope with future demands.

Standards such as IEC61850 and SP95 exist already and could help provide another piece of the foundation in terms of business systems integration. Defining the objects that the systems maintain data about, helps to ensure that any new requirement can be met by the



large volumes of old PSTN-compliant equipment remaining in operation today and it is still unclear just how much of this equipment will not be compatible with the 21CN. To make matters worse, the end of the current GSM/GPRS network infrastructure is nearing, as the licences for this generation of mobile communications expires around 2010. Existing GSM/GPRS equipment will not be compatible with third-generation (3G) networks, requiring large-scale replacement.

Proposed approaches to tackling 21CN compliance range from implementing converter modules that adapt existing equipment to the new infrastructure, through to replacement with new technologies. Whilst tempting, the

construct and there are often few immediate benefits to show for the additional effort. However, experience shows that with the right foundations in place anything can be achieved thereafter at a lower cost and with less risk. The wide range of IT and communications standards now available provides all that is needed to choose the right foundations.

Representatives of the UK water industry have joined together to define standards starting with a new telemetry protocol to facilitate interoperability between field devices and supervisory systems. This protocol standard does not solve the issue of 21CN compliance, the loss of GSM/GPRS or how to do effective business integration. However it is one piece of the

existing interfaces rather than defining another point-to-point link. The future could be that business systems automate large parts of manual or semi-manual processes currently undertaken today (such as creating or maintaining asset details for a utility).

With such a massive change on the horizon, the more enlightened within industry are already seeing how they can evolve – not only to adapt their current working practices and procedures, but also what they can do to take full advantage of the infrastructure and data possibilities these new protocols will deliver. It is fair to say that the possibilities are truly staggering as long as a long-term view is taken, rather than a short-term quick fix. ■